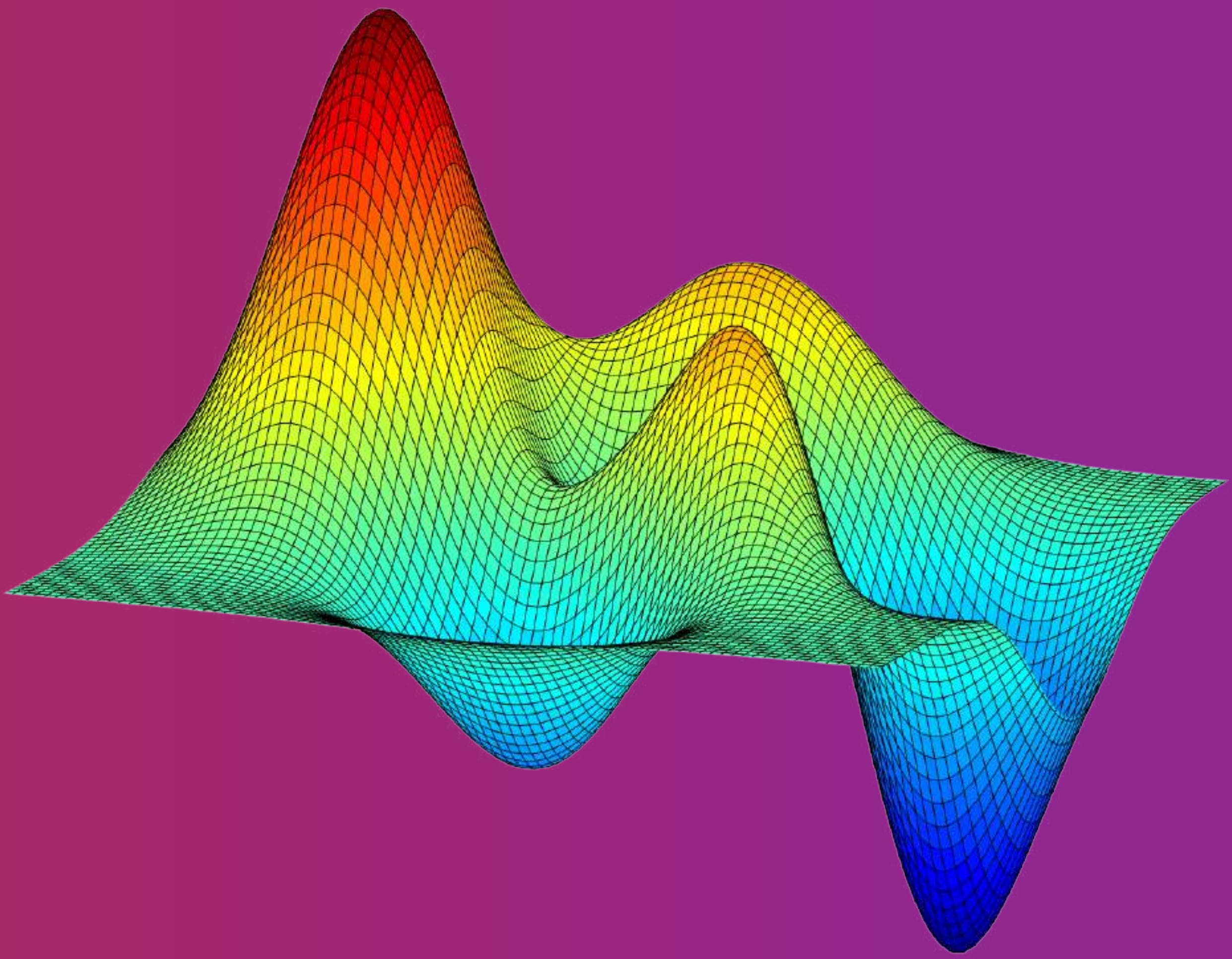
Nano
Degree Program

MATLAB
Fundamentals

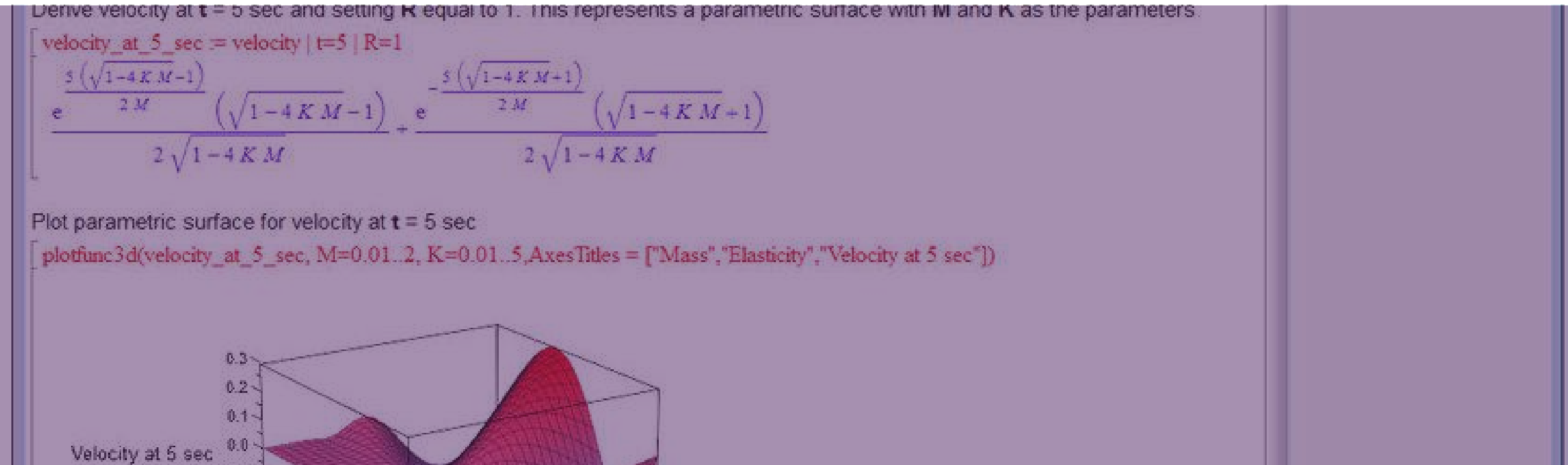


DIYGURU.ORG

Manufacturers of equipment used in manufacturing, testing, and power generation applications face complex challenges to develop embedded applications that integrate with mechanical, electrical, control, and signal processing systems. Forward-looking companies are turning to Model-Based Design to redefine the way they perform system-level design.

Model-Based Design enables industrial equipment makers to create executable specifications in the form of Simulink® models that provide clear design direction to diverse engineering groups.

Sharing models shifts the focus of the development process from design and test on hardware to design and test with models, enabling early verification across domains before investing in prototypes. Machine makers then leverage code-generation technology to reduce rework, link code to design, and allow software engineers to focus on software architecture.



Derive velocity at **t** = 5 sec and setting **R** equal to 1. This represents a parametric surface with **M** and **K** as the parameters.

```
velocity_at_5_sec := velocity | t=5 | R=1
```

$$\frac{e^{\frac{5\left(\sqrt{1-4KM}-1\right)}{2M}}\left(\sqrt{1-4KM}-1\right)}{2\sqrt{1-4KM}}+\frac{e^{-\frac{5\left(\sqrt{1-4KM}+1\right)}{2M}}\left(\sqrt{1-4KM}+1\right)}{2\sqrt{1-4KM}}$$

Plot parametric surface for velocity at **t** = 5 sec

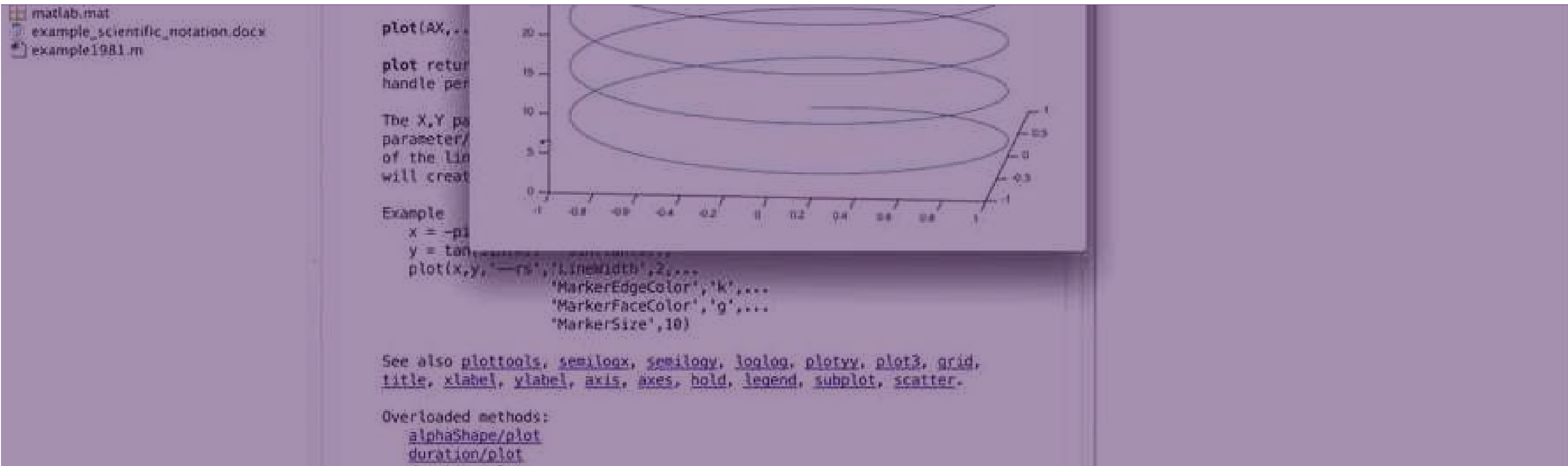
```
plotfunc3d(velocity_at_5_sec, M=0.01..2, K=0.01..5,AxesTitles = ["Mass","Elasticity","Velocity at 5 sec"])
```

What are the program objectives?

This course teaches computer programming to those with little to no previous experience. It uses the programming system and language called MATLAB to do so because it is easy to learn, versatile and very useful for engineers and other professionals. MATLAB is a special-purpose language that is an excellent choice for writing moderate-size programs that solve problems involving the manipulation of numbers. The design of the language makes it possible to write a powerful program in a few lines. The problems may be relatively complex, while the MATLAB programs that solve them are relatively simple. As a result, MATLAB is being used in a wide variety of domains from the natural sciences, through all disciplines of engineering, to finance, and beyond, and it is heavily used in industry. Hence, a solid background in MATLAB is an indispensable skill in today's job market.

What are the main highlights of the program?

- Learn without a career break with online classes available 24*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.
- Students taking the course will get a MATLAB Online license free of charge for the duration of the course.



```
plot(AX,...

plot retur
handle per

The X,Y pa
parameter/
of the lin
will creat

Example
   x = -pi
   y = tan
   plot(x,y,'--rs','LineWidth',2,...
                   'MarkerEdgeColor','k',...
                   'MarkerFaceColor','g',...
                   'MarkerSize',10)

See also plottools, semilogx, semilogy, loglog, plotyy, plot3, grid,
title, xlabel, ylabel, axis, axes, hold, legend, subplot, scatter.

Overloaded methods:
   alphaShape/plot
   duration/plot
```

Who should apply?

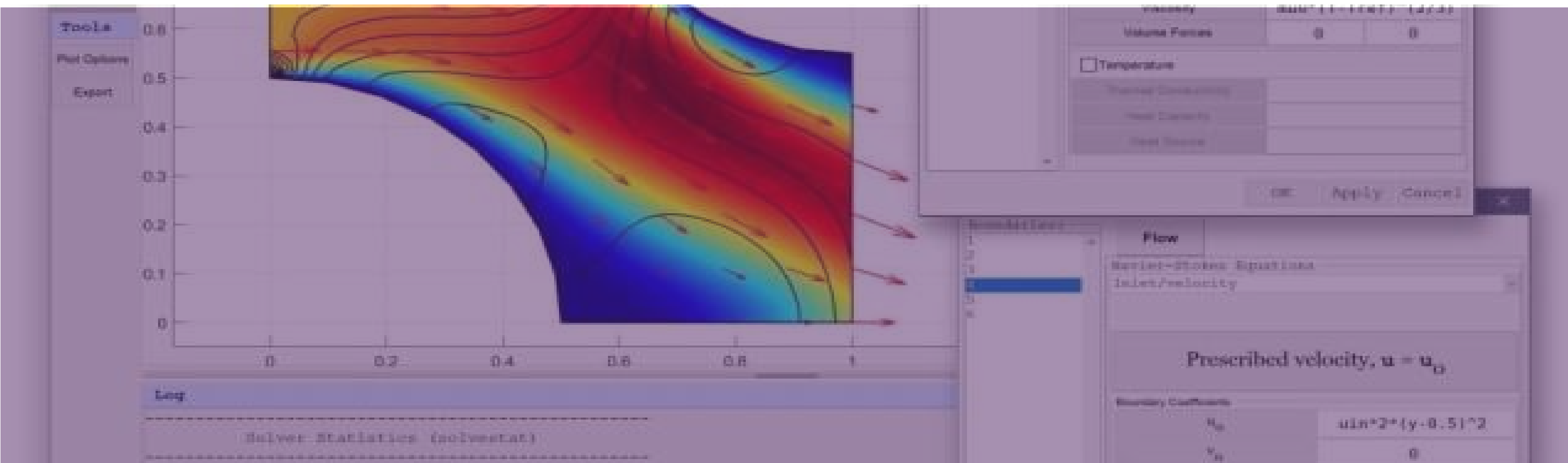
The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Programming enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Design and Engineering Sector.

What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for MATLAB software so that they can practice with the progress of the course.



Navier-Stokes Equations
Inlet/velocity

Prescribed velocity, $u = u_0$

uin*2*(y-0.5)^2

Solver Statistics (solvestat)

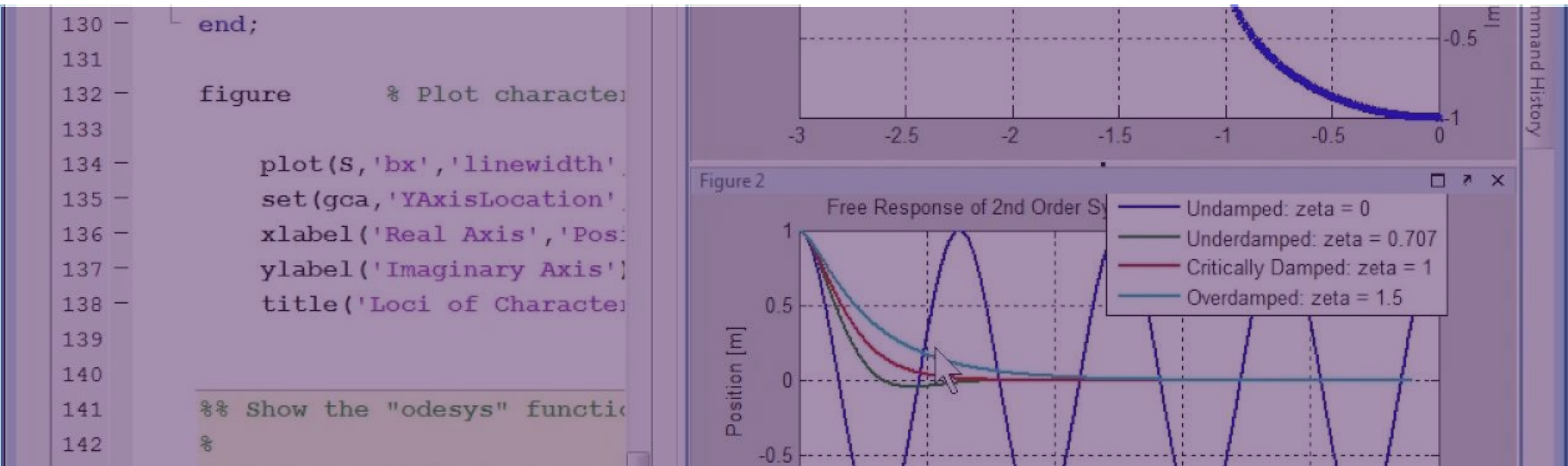
What is the learning methodology?

DIYguru presents a Nano Degree program on MATLAB Fundamental Certification Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 30 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

What are the learning outcomes?

- Able to use Matlab for interactive computations.
- Familiar with memory and file management in Matlab.
- Able to generate plots and export this for use in reports and presentations.
- Able to program scripts and functions using the Matlab development environment.
- Able to use basic flow controls (if-else, for, while).
- Familiar with strings and matrices and their use.
- Use MATLAB effectively to analyze and visualize data.
- Apply numeric techniques and computer simulations to solve engineering-related problems.
- Apply a top-down, modular, and systematic approach to design, write, test, and debug sequential MATLAB programs to achieve computational objectives.
- Design and document computer programs and analyses in a careful and complete manner so as to effectively communicate results, to facilitate evaluation and debugging by another programmer, and to anticipate and resolve user errors.
- Demonstrate understanding and use of fundamental data structures (classes).
- Create and control simple plot and user-interface graphics objects in MATLAB.



```
    end;

    figure       % Plot characte

        plot(S,'bx','linewidth'
        set(gca,'YAxisLocation'
        xlabel('Real Axis','Pos
        ylabel('Imaginary Axis')
        title('Loci of Characte


    %% Show the "odesys" functi
    %
```

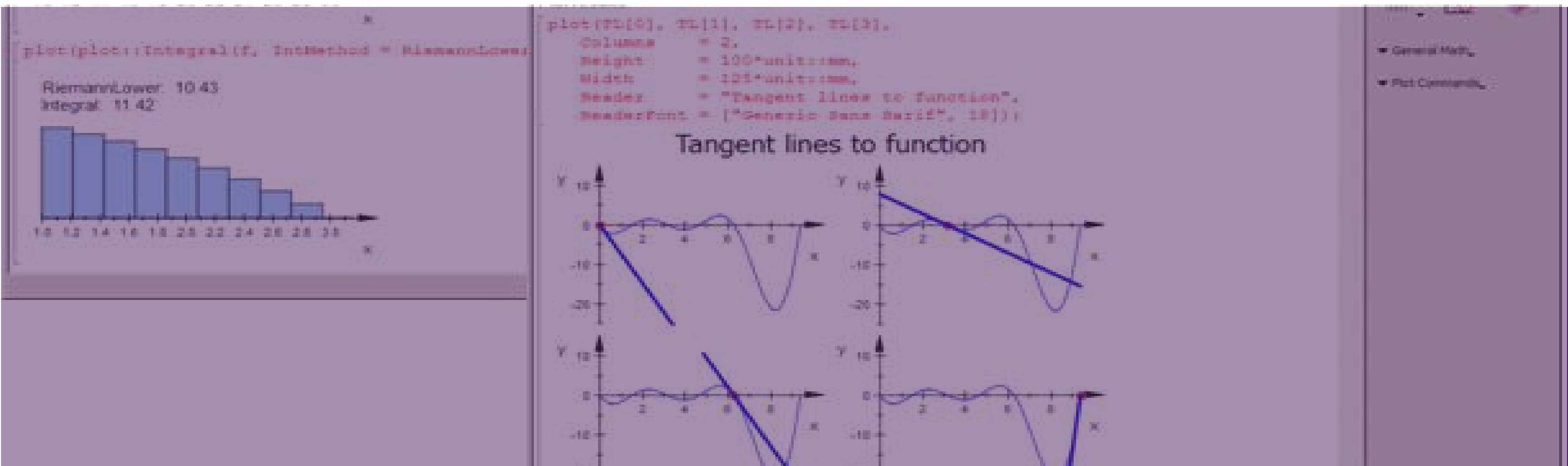
How to apply?

Enrollment procedure follows a few hassle-free steps:

- Signup with your operational e-mail ID.
- Select “MATLAB Fundamental Certification Course”.
- Select "Take the Course".
- Apply coupon code if applicable.
- Fill the required fields on the form.
- Select your preferred payment gateway.
- Pay the total amount.
- Select "Start Course" and shift yourself to an upskilling mode.

What is the fee structure?

The actual fee of this elite program is INR 2500 + 18% GST that is INR 2950 only.



```
plot(plot::Integral(f, IntMethod = RiemannLower
```

```
plot(TL[0], TL[1], TL[2], TL[3],
     Columns    = 2,
     Height     = 100*unit::mm,
     Width      = 125*unit::mm,
     Header     = "Tangent lines to function",
     HeaderFont = ["Generic Sans Serif", 18]);
```

Program Structure

Introduction

Starting out with Matlab

Managing Vectors & Matrices

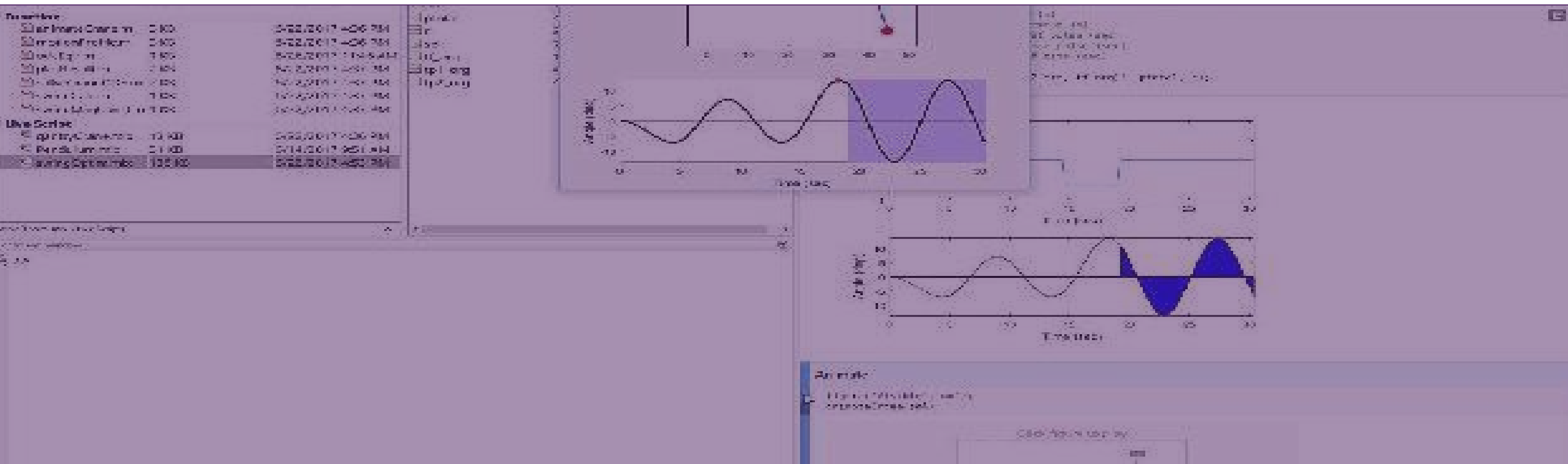
Creating MATLAB Scripts

Conditional Logic & Loops

Managing Strings & Data Structure

Performing advanced Plotting and Statistical Analysis

Conclusion



TRUSTED BY

"Just a quick note to let you know how pleased and impressed we are with the two day training programme handled at our premises. We were very new to the Electric Vehicle aspect and terminology used for as a non - technical personnel. Though the topic of Electric vehicle is a bit typical and dry, the way the trainer has kept us in pace with interactive session and made the thing clear and clarified the doubts we raised was very much helpful "

- Rajesh Mutharaju, Head HR - Hyundai Motors

"At Bosch Bangalore & Coimbatore, the DIYguru training programme has helped a lot in improvising the concepts of Electric Vehicle Design & Engineering for our experienced and fresh employees. The trainers are of high quality and knowledgable in terms of delivering the contents and making things understandable. We look forward to have a continuous relationship."

- R Shashi Kumar, Head HR - Robert Bosch Engineering

"Partnering with DIYguru we can see the budding entrepreneurs working closely on EV projects. I can see the interaction and enthuse which is there with all the young boys and girls who are part of this project. They are doing exceptionally well and I congratulate entire DIYguru team to further get more the guys and be a part of the electric revolution."

- Praveen Shrivastava, Zypp Mobycy

"DIYguru is giving a platform to new entrepreneurs in building up skills so that they get ready for the current market requirement. They are bridging the gap between the actual industrial requirement and conventional education system which are available with the schools and colleges."

- Sumit Agrawal,, Engineer & Entrepreneurs

"Doing this course helped me to understand the fundamentals of an electric vehicle, from Batteries to power train BMS to controller the basic know -hows are clear to me. This course helped me to change my attitude from mobility as a product to mobility as a service. As a student, I have got to understand the job and business opportunity which are waiting at our doorsteps within E mobility sector."

- Atharva Pitale, Yashwantrao Chavan College of Engineering

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